

WBS 6.2.1.5: BNL Staves Report

Gerrit filling in for Gabriella for the sake of efficiency

Gerrit van Nieuwenhuizen
May 12, 2016

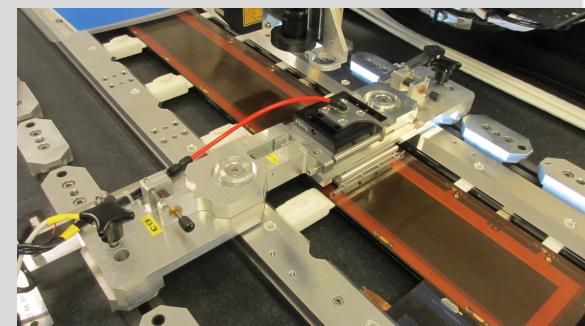
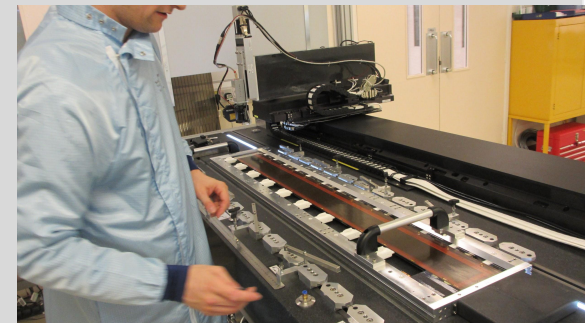
BNL stave deliverables

Layer	Radius	staves per layer	# of modules	# of hybrids	# of ABC130	# of channels	m ²
0	405	28	784	1568	15680	4,01	7,45
1	562	40	1120	2240	22400	5,73	10,53
2	762	56	1568	1568	15680	4,01	14,75
3	1000	72	2016	2016	20160	5,16	18,96
Total full barrel		392	10976	14784	147840	37,85	103,43

- 392 + 10% (?)
- Equal split US and UK
- BNL will be the sole US stave production site
- BNL will have to produce 220 staves

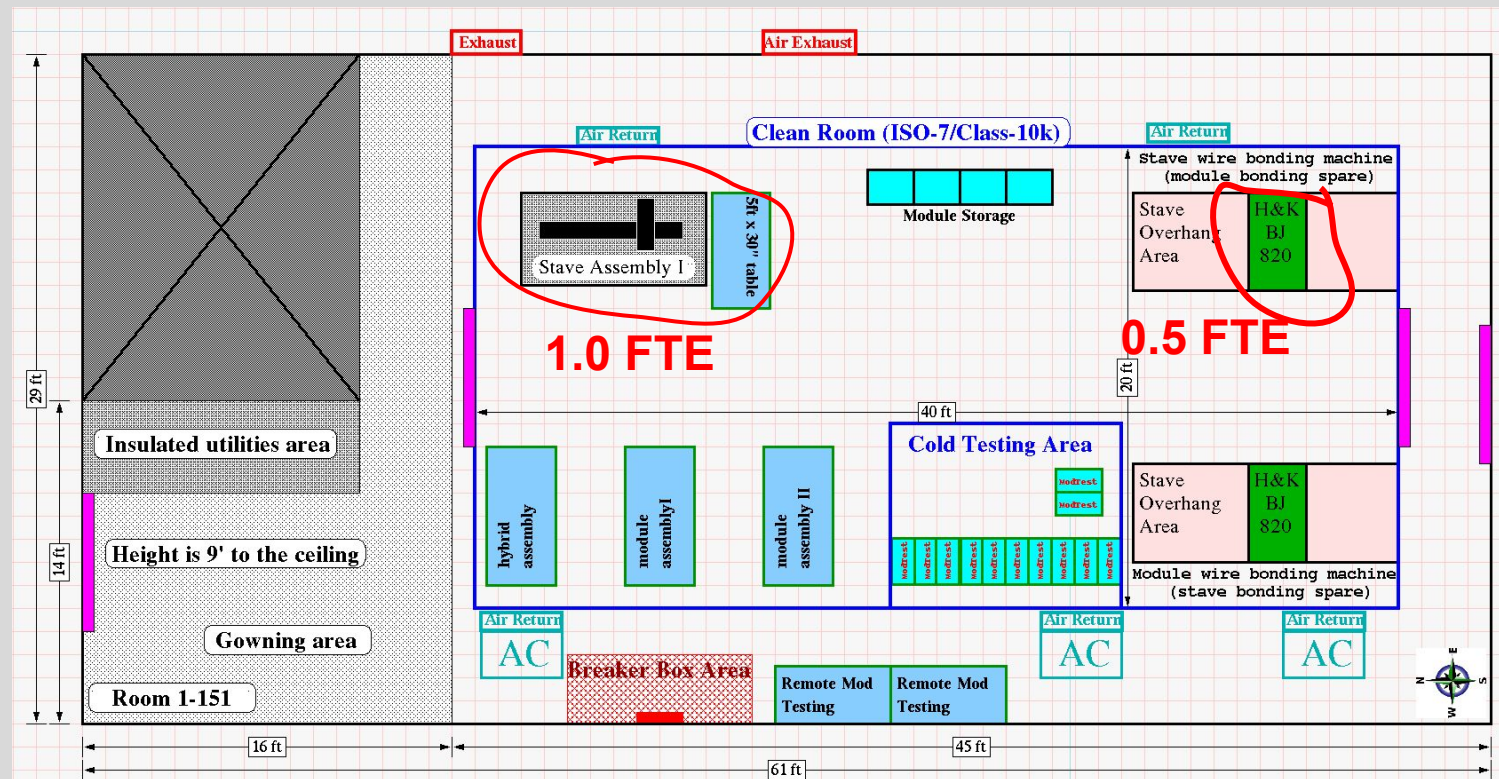
BNL stave production

- 220 staves to do
- Trying to copy as much as possible from RAL
 - Probably mechanically modified
 - Use glue dispenser instead of stencils
- Have to do 2 staves per week
 - About 15 minutes to put a module down
 - 1 day per stave side → OK
 - Amount of bonding wires is peanuts
 - Probably 1 bonding day per week is OK
- Burn in, thermal cycle of 3 days per stave
 - We will need proper transport/test boxes
 - We need a cold test/storage box



Construction feasible but tight (glue curing time!), QA should be extensive

BNL stave production resources



There is not enough space inside the clean room for stave testing!

BNL Stave Assembly Station procurement



*Dedicated to the
Science of Motion*

WORLD HEADQUARTERS

Aerotech, Inc.
101 Zeta Drive
Pittsburgh, PA 15238
Ph: 412-963-7470
Fax: 412-963-7459
Email: sales@aerotech.com

AEROTECH WORLDWIDE

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www.aerotech.com

Company: **Brookhaven National Lab**
PO Box 5000
Upton, NY 11973

Contact: **Dr. Gerrit van Nieuwenhuizen**
Title: Physics Associate I
Phone: (631) 344-6151
Fax:
Email: nieuwhzn@gmail.com

Quotation Number: **113141-00**

Date: 10-Feb-2016
Expiration Date: 26-Mar-2016

Project Name: ATLAS Phase II



ALS25000XY linear motor
stage system with hardcover.


- PO out per May 6th, now needs design approval
- Includes granite table and stand
- Delivery somewhere in August
- Need to be able to move directly into clean room
- Needs whistles and bells, interlocks, camera, etc.

BNL Renovation Clean Room Area



Pretty much done, just some extra electric circuits for the clean room

BNL Clean Room Procurement

 TERRA UNIVERSAL.COM Critical Environment Solutions Including  LaboratoryEquipment.com		Page: 1	
800 S. Raymond Ave., Fullerton, CA 92831 USA		Tel +1 714-578-6100 * Fax +1 714-578-	
PO/Request ID		Quoted	Needed
		02/25/16	07/20/16
		Est. Lead Time	
		8 weeksADA	
		Payment Terms	
		50% Down/40% PreShip/Net 30 O/	
		TUI Ref	
		169498	
Order Manager		Partner	
Miriam Valdez, Prod Specialist		Zachary Illingworth, BS ME	
		Sales Team Leader	
		Mars Yalkut, BS EE, MBA	
		Sales Manager	
		Rod Behnia, BS, MS EE	
Phone: +1 714-578-6109		Phone: +1 714-578-6107	
Fax: +1 714-578-3109		Cell: +1 714-872-1701	
		Fax: +1 714-578-3107	
Phone: +1 714-578-6108		Cell: +1 949-690-4899	
		Fax: +1 714-578-3108	
Miriam@TerraUniversal.com		Zachary@TerraUniversal.com	
		Mars@TerraUniversal.com	
		Rod@TerraUniversal.com	
Local Sales & Support Representative		Trans ID	
TUI Direct Support - T000, Fullerton CA			
Requested By:		End User:	Invoice To Client # 55910
Gerrit Van Nieuwenhuizen		Andrew Cook	Accounting Department
Brookhaven National Laboratory		Brookhaven National Laboratory	Brookhaven National Laboratory
46 Dawn Drive		PO Box 5000, Fiscal Div. Bldg. 400-D	PO Box 5000
Shirley, NY 11967		Upton, NY 11973-5000	Fiscal Div. Bldg. 400-D
Work: 857-928-7477		Work: 516-282-3489	Upton, NY 11973-5000
Email: nieuwhzn@bnl.gov		Email: cook@bnl.gov	



- PO out, first payment April 18th, clean room in production
- Clean room will be installed by vendor
- Expect installation end of June

BNL Hesse BondJet 820 (pre-owned)



QUOTATION		
CSI Semiconductor Solutions Ltd		CSI Semi
www.csisemi.com		
Mr. Paul Cahill PhD., Owner		DATE: 20/04/2016
25 Ard Aoibhinn , Rosslare Strand,		# 1368
Co. Wexford, Ireland. European Office		VAT No: IE 3384299HH
Cell: +353 85 8892428		
Tel: +353 53 9173978		
TO		
Brookhaven National Laboratory		
Dr. Gerrit J. van Nieuwenhuizen		
+1-857-928-7477		
Email: nieuwhzn@gmail.com		
Bldg. 510, P.O. Box 5000, Upton, NY 11973-5000		
DESCRIPTION	NUMBER	AMOUNT \$
Hesse Mechantronics Bondjet 820 Automatic Wedge Wire Bonder		

- Procuring used 2013 Hesse BondJet 820
- Should arrive at BNL before end of June

BNL OGP SmartScope Flash 302 (pre-owned)



OGP Smartscope Flash 302 Optical CMM System

Part number: ca00302
Manufacturer: OGP
Model: Smartscope Flash 302
Vintage: 2011

Description

Product Description

OGP Smartscope Flash 302
Optical Gaging Products
Smartscope Flash 302 Optical CMM System, sn S
Mfg 6-17-2011,
14 X 14 Inch Glass Insert Table,
1 x System Technologies Windows 7 PC,
1 x Remote Controller,
Cords and Cables, Power:
120 VAC 50-60 Hz.,
Weight 450, Dimensions 80 x 80 x 80 Centimetre

QUOTATION

CSI Semiconductor Solutions Ltd

www.csisemi.com

Mr. Paul Cahill PhD., Owner
25 Ard Aoibhinn , Rosslare Strand,
Co. Wexford, Ireland. European Office
Cell: +353 85 8892428
Tel: +353 53 9173978

TO

Brookhaven National Laboratory
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+1-857-928-7477
Email: nieuwhzn@gmail.com
Bldg. 510, P.O. Box 5000, Upton, NY 11973-5000

CSI Semi

DATE:	05/05/2016
#	1370
VAT No:	IE 3384299HH

- Procuring used 2011 SmartScope
- Should arrive at BNL in before end of June

BNL Looking for affordable glue dispensers



D-595

D-593

- Switching to UV cured glue, less hassle than stencils
- Pretty expensive, can easily hit \$50k

BNL SurfX AtomFlo 400 Plasma Cleaner



- Procured factory refurbished plasma cleaner, mounted it on XY stage
- Can clean a full hybrid panel, need to check cleaning with test bonding

BNL Human Resources

Function	FY17 FTE	FY18 FTE	FY19 FTE	FY20 FTE	FY21 FTW	FY22 FTE	FY23 FTE
Hybrid Assembly	0.25	----->	0.50	0.50	0.50	0.50	----->
Hybrid Bonding	0.05	----->	0.50	0.50	0.50	0.50	----->
Module Assembly	0.25	----->	0.50	0.50	0.50	0.50	----->
Module Bonding	0.10	----->	1.00	1.00	1.00	1.00	----->
Stave Assembly	0.50	----->	1.00	1.00	1.00	1.00	----->
Stave Bonding	0.05	----->	0.50	0.50	0.50	0.50	----->
Supervision	1.00	----->	2.00	2.00	2.00	2.00	----->

Resource	FY17 FTE	FY18 FTE	FY19 FTE	FY20 FTE	FY21 FTW	FY22 FTE	FY23 FTE
Phil (Tech1)	0.80	1.00	1.00	1.00	1.00	1.00	----->
Russ (Tech2)	0.80	1.00	1.00	1.00	1.00	1.00	----->
Tech3	0.00	0.20	1.00	1.00	1.00	1.00	0.00
Tech4	0.00	0.20	1.00	1.00	1.00	1.00	0.00
Gerrit	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Dave	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Alessandro	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Stefania (PostDoc1)	0.80	0.80	0.80	0.80	0.80	0.80	0.80

Note that it is assumed that all testing is done by outside institutions with some reasonable BNL supervision

BNL Outside institutes testing army

BNL will almost completely rely on a standing army of outside students and post-docs

A roundup:

- **Brandeis**
 - Gabriella at BNL Q4CY16: start up testing efforts and stave deliverable manager
 - Hannah will be at BNL for FY17
 - There will always be 1 grad student at BNL during FY17 until FY23 plus overlap
 - 1 Postdoc will be at BNL in the critical period to set up a test stand
 - During production 2 undergraduates can do Summer work at BNL
- **Harvard**
 - Similar level of commitment as Brandeis
- **Duke**
 - Has already contributed in the test setup, please see Mark Kruse's talk
 - Similar level as commitment as Brandeis for graduate and undergraduate students
 - Lack of involvement of postdocs is a concern
- **UPenn**
 - Has already contributed greatly to ASIC design and testing
 - Interested in helping out with the testing
- **Stony Brook**
 - Close proximity to BNL but unclear about NSF grant 'interference'

We will have to work out the funding issues for all institutes involved